

Listing of Claims

The below listing of claims will replace all prior versions of claims in the application.

1. (Previously Presented) A method of estimating timing of at least one of the beginning and the end of a transmitted signal segment in the presence of time delay in a signal transmission channel in an OFDM system, the method comprising:

providing a set of pseudo-random signal m-sequences $PN(t;k)$ ($k = 1, \dots, K; K \geq 1$) for which a convolution signal formed from any two sequences satisfies $PN(t;i)*PN(t + \Delta t;j) = \delta(\Delta t)\bullet\delta(i,j)$, where i and j are index numbers identifying the two sequences, t is a time variable, $\delta(\Delta t)$ is a modified delta function with infinitesimal width Δt_1 ($\delta(\Delta t) = 0$ for $|\Delta t| > \Delta t_1$) and $\delta(i,j) = 0$ unless $i = j$;

appending a selected sequence $PN(t;k)$ from the set of pseudo-random signal m-sequences $PN(t;k)$ to at least one signal frame to be transmitted to form a padded signal frame;

transmitting at least one padded signal frame as the transmitted signal through the signal transmission channel in which the transmitted signal may be received with an uncontrollable time delay Δt (delay);

receiving a received signal $Rc(t)$ of the transmitted signal associated with the at least one padded signal frame being transmitted and forming a composite signal, denoted as $Rc(t; \Delta t; comp)$, given as:

$$Rc(t; \Delta t; comp) = \sum_{k=k1}^{k2} PN(t + \Delta t; k) * Rc(t),$$

where Δt is a selected time increment and $k1$ and $k2$ satisfy $1 \leq k1 \leq k2 \leq K$;

forming a remainder signal, denoted as $Rc(t; rem)$, where $Rc(t; rem) = Rc(t) - Rc(t; \Delta t; comp)$; and

determining from the remainder signal at least one time at which said selected sequence $PN(t;k)$ ($k = k1, k1+1, \dots, k2$) associated with said at least one padded signal frame begins in the received signal $Rc(t)$.

2. (Previously Presented) The method of claim 1, further comprising determining a carrier frequency associated with said selected sequence $PN(t;k)$ of the at least one padded signal frame being transmitted.

3. (Previously Presented) The method of claim 1, further comprising using at least one of the selected sequences PN(t;k) associated with the padded signal frames being transmitted to estimate at least one parameter associated with said signal transmission channel.

4. (Previously Presented) The method of claim 1, further comprising replacing at least one guard interval associated with at least one of said signal frames to be transmitted with a selected one of the m-sequences PN(t;k).

5. (Previously Presented) The method of claim 1, further comprising using at least one of the selected sequences PN(t;k), associated with one of said padded signal frames being transmitted, to provide time synchronization for said associated padded signal frame.

Claims 6-10: Cancelled.